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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/088,503 | 03/28/2002 | Shigeo Yamanaka | 220802US2XPCT | 2408 |

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| EXAMINER | |
|---|---|
| LE, TRAN Q | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2633 | |

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/088,503 | YAMANAKA ET AL. | |
| | Examiner | Art Unit | |
| | Tran Q. Le | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *28 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/28/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2 recites the limitation "an optical amplifier in which the second multiplexed signal output from the second optical wavelength multiplexer is multiplied" in p. 7, lines 18-19 (amended claim). There is insufficient antecedent basis for the limitation "the second optical wavelength multiplexer" in the claim.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatenable by Archambault (US Patent No. 6,567,196).

Regarding claim 1, Archambault discloses an optical wavelength division multiplexing and transmission apparatus (fig. 12 and col. 8, lines 23-25), comprising:

a first optical wavelength multiplexer (1310-1, fig. 13) in which a plurality of prescribed optical wavelength signals of a group (λ1-λ 8) are multiplexed with each other and a first multiplexed signal is output (1408, fig. 13), and a synthetic optical wavelength multiplexer (1314-1, fig. 13) in which the first multiplexed signal output (1408, fig. 13) from the first optical wavelength multiplexer (1310-1, fig. 13) and a second multiplexed signal (1422, fig. 13) are multiplexed with each other and a synthetic multiplexed signal is output (1420, fig. 13), and

a second optical wavelength multiplexer (1310-2, fig. 13) in which a plurality of optical wavelength signals of a group (λ9-λ 16, fig. 13) having a wavelength distribution different from that of the group of prescribed optical wavelength signals multiplexed by the first optical wavelength multiplexer are multiplexed with each other and are output as the second multiplexed signal (1422, fig. 13), and an amplifier (1312-1, fig. 13) in which the second multiplexed signal (1422, fig. 13)output from the second optical wavelength multiplexer (1310-2, fig. 13) is multiplied.

Archambault differs from claim 1 of the present invention in that Archambault does not disclose how the multiplexers are being positioned in the racks. Examiner

takes official notice that positioning components in different racks or housing is extremely well known in the art. Furthermore, shifting the location of parts (In re Japikse, 86 USPQ 70 (CCPA 1950)) or making separable (Nerwin vs. Erlichman, 168 USPQ 177, 179 (PTO Bd. of Int. 1969) is not patentable and/or with the knowledge of a person of ordinary skill in the art. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to position the first multiplexer and the synthetic multiplexer on one rack (e.g. master rack) and the second multiplexer on another rack (e.g. slave rack). One motivation for doing this is to allow readily access for repair.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US Pub. No. 2002/0012144) in view of Guy (US Patent No. 6,690,886).

Regarding claim 2, in view of 112 problem, Lin discloses an optical wavelength division multiplexing and transmission apparatus (fig. 4), comprising

a synthetic optical wavelength demultiplexer (375, fig. 4) in which a synthetic multiplexed signal (input signal of 375, fig. 4) formed by multiplexing a plurality of multiplexed signals, which are respectively formed of a plurality of groups of optical wavelength signals having a plurality of optical wavelength distributions different from each other, with each other is received (it is obvious that the multiplexed signal at the input of the demultiplexer 375 is formed by a plurality of multiplexed signals, which are respectively formed of a plurality of groups of optical wavelength signals having a plurality of optical wavelength distributions different from each other on the transmitting

side), the synthetic multiplexed signal is demultiplexed to both a first multiplexed signal (1, fig. 4) and a second multiplexed signal (2, fig. 4) and both the first multiplexed signal, and the second multiplexed signal are output, and a first optical wavelength demultiplexer (310, fig. 4) in which the first multiplexed signal output (1, fig. 4) by the synthetic optical wavelength demultiplexer (375, fig. 4) is demultiplexed to a plurality of optical wavelength signals of one group (λ1-λ n ) and the group of optical wavelength signals is output, and

a second optical wavelength demultiplexer (311, fig. 4) in which the second multiplexed signal output (2, fig. 4) by the synthetic optical wavelength demultiplexer (375, fig. 4) is demultiplexed to a plurality of optical wavelength signals of another group (λ'1-λ 'n) and the group of optical wavelength signals is output.

Lin differs from claim 1 of the present invention in that Lin does not disclose how the demultiplexers are being positioned in the racks. Examiner takes official notice that positioning components in different racks or housing is extremely well known in the art. Furthermore, shifting the location of parts (In re Japikse, 86 USPQ 70 (CCPA 1950)) or making separable (Nerwin vs. Erlichman, 168 USPQ 177, 179 (PTO Bd. of Int. 1969) is not patentable and/or with the knowledge of a person of ordinary skill in the art. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to position the first demultiplexer and the synthetic demultiplexer on one rack (e.g. master rack) and the second demultiplexer on another rack (e.g. slave rack). One motivation for doing this is to allow readily access for repair.

Moreover, Guy, in the same field of endeavor, teaches an optical amplifier (27A, fig. 3B) in which a multiplexed signal output from an synthetic optical wavelength demultiplexer (35B, fig. 3B) is multiplied.

Therefore, it would have been obvious for one ordinary skill in the art at the time the invention was made to use an amplifier such as the one of Guy in the WDM system of Lin in order to compensate for the power loss from the long-haul transmission.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault (US Patent No. 6,567,196) in view of Winzer et al. (US Patent No. 4,441,181).

Regarding claim 4, Archambault discloses all the aspects of claim 1, except fails to teach a plurality of noise cut filters corresponding to the first multiplexed signal and the second multiplexed signal respectively on an input side of the synthetic optical wavelength multiplexer on which the first multiplexed signal and the second multiplexed signal are input.

However, Winzer, in the same field of endeavor, teaches a plurality of noise cut filters (F12, F34, fig. 2) corresponding to the first multiplexed signal (output of G1, fig. 2) and the second multiplexed signal (output of G3', fig. 2) respectively on an input side of the synthetic optical wavelength multiplexer (F14, fig. 2) on which the first multiplexed signal and the second multiplexed signal are input.

Therefore, it would have been obvious for one ordinary skill in the art at the time the invention was made to use a plurality of noise cut filters such as the ones of Winzer

in the WDM system of Archambault in order to provide clean signals at the inputs of the synthetic multiplexer before they are combined into a multiplexed signal and then transmitted into the transmission system.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault (US Patent No. 6,567,196) in view of Novak et al. (US Patent No. 6,708,002).

Regarding claim 6, Archambault discloses all the aspects of claim 1, except fails to teach a plurality of dispersion compensation fibers corresponding to the first multiplexed signal and the second multiplexed signal respectively on an input side of the synthetic optical wavelength multiplexer on which the first multiplexed signal and the second multiplexed signal are input.

However, Novak, in the same field of endeavor, teaches a plurality of dispersion compensation fibers (312, 315, fig. 3) corresponding to the first multiplexed signal (output of the multiplexer 303, fig. 3) and the second multiplexed signal (output of the multiplexer 306, fig. 3) respectively on an input side of the synthetic optical wavelength multiplexer (330, fig. 3) on which the first multiplexed signal and the second multiplexed signal are input (fig. 3).

Therefore, it would have been obvious for one ordinary skill in the art at the time the invention was made to use a plurality of dispersion compensation fibers such as the ones of Novak in the WDM system of Archambault in order to compensate for the dispersion experienced by WDM optical signals from traveling over long distance.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Archambault (US Patent No. 6,567,196) in view of Touma (US Pub No. 2004/0264956).

Regarding claim 8, Archambault discloses all the aspects of claim 1, except fails to teach an amplifier of the master rack for the first multiplexed signal, an amplifier of the master rack for the synthetic multiplexed signal, a wavelength level monitoring device of the master rack for monitoring an output of the amplifier for the synthetic multiplexed signal, and a plurality of output control circuits for selectively controlling a plurality of levels of signals output from the amplifier for the first multiplexed signal, the amplifier for the second multiplexed signal and the amplifier for the synthetic multiplexed signal respectively in response to a detection output of the wavelength level monitoring device in which a plurality of levels of the optical wavelength signal of the first multiplexed signal, the second multiplexed signal the synthetic multiplexed signal are monitored.

However, Touma, in the same field of endeavor, teaches an amplifier for a multiplexed signal (11a, fig. 1), a wavelength level monitoring device (13a, fig. 1) for monitoring an output of the amplifier (11a, fig. 1) for the multiplexed signal, and an output control unit (12a, fig. 1) for controlling the output signal level from the amplifier for the multiplexed signal in response to a detection output of the wavelength level monitoring device.

Therefore, it would have been obvious for one ordinary skill in the art at the time the invention was made to use an amplifier, a wavelength level monitoring device, and

an output control unit such as the ones of Touma in the WDM system of Archambault at each output of each multiplexer in order to mutually equalize the output levels of the multiplexed signals and thus provide a desired output level for the final multiplexed signal before transmitting into the transmission medium.

10. Claim 3, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clark (US Patent No.6,041,152) in view of Novak et al. (US Patent No. 6,708,002).

Regarding claim 3,Clark discloses an optical wavelength division multiplexing and transmission apparatus, comprising:

a plurality of prescribed optical wavelength signals of a group (fig. 1, wavelengths of 1555.50-1560.86) are multiplexed with each other and a first multiplexed signal is output (output of 5, fig. 1), a synthetic optical wavelength multiplexer (1, fig. 1) in which the first multiplexed signal output from the first optical wavelength multiplexer (5, fig. 1) and a second multiplexed signal (output of 4, fig. 1) are multiplexed with each other (fig. 1) and a first synthetic multiplexed signal is output (output of 1, fig. 1), a synthetic optical wavelength demultiplexer (7, fig. 1) in which a second synthetic optical wavelength transmitted from another optical wavelength division multiplexing and transmission apparatus of an opposite end through an optical transmission line (fig. 1 and col. 3, lines 52-62) is demultiplexed to both a third multiplexed signal (input of 7, fig. 1) and a fourth multiplexed signal (input of 6, fig. 1) and both the third multiplexed signal and the fourth multiplexed signal are output, and a first optical wavelength demultiplexer (7, fig. 1) in which the third multiplexed signal output from synthetic optical wavelength

demultiplexer(1, fig. 1) is demultiplexed to a plurality of optical wavelength signals of a group (fig. 1, wavelengths of 1537,94-1543.19) and the group of optical wavelength signals is output, and

a second optical wavelength multiplexer (4, fig. 1) in which a plurality of optical wavelength signals of a group (fig. 1, wavelengths of 1547.97-1552.77) having a wavelength distribution different from that of the group of prescribed optical wavelength signals multiplexed by the first optical wavelength multiplexer (5, fig. 1) are multiplexed with each other and are output as the second multiplexed signal (output of 4, fig. 1), and a second optical wavelength demultiplexer (6, fig. 1) in which the fourth multiplexed signal (input of 6, fig. 1) output by the synthetic optical wavelength demultiplexer (1, fig. 1) is de-multiplexed to a plurality of optical wavelength signals of another group (fig. 1, wavelengths of 1530.08-01535.29) and the group of optical wavelength signals is output, and an amplifier in which the second multiplexed signal output from the second optical wavelength multiplexer is multiplied.

Clark differs from claim 1 of the present invention in that Clark does not disclose how the multiplexers/demultiplexers are being positioned in the racks. Examiner takes official notice that positioning components in different racks or housing is extremely well known in the art. Furthermore, shifting the location of parts (In re Japikse, 86 USPQ 70 (CCPA 1950)) or making separable (Nerwin vs. Erlichman, 168 USPQ 177, 179 (PTO Bd. of Int. 1969) is not patentable and/or with the knowledge of a person of ordinary skill in the art. Thus, it would have been obvious to a person having ordinary skill in the art at the time of the invention to position the first multiplexer, the synthetic multiplexer, the

first demultiplexer, and the synthetic demultiplexer on one rack (e.g. master rack) and the second multiplexer and the second demultiplexer on another rack (e.g. slave rack). One motivation for doing this is to allow readily access for repair.

Moreover, Novak teaches an amplifier (amplifier of 306, fig. 3) in which the second multiplexed signal output from the second optical wavelength multiplexer (306, fig. 3) is multiplied.

Therefore, it would have been obvious for one ordinary skill in the art at the time the invention was made to use an amplifier such as the one of Novak in the WDM system of Lin in order to compensate for the power loss from the long-haul transmission.

Regarding claim 5, Novak further teaches a plurality of noise cut filters (BPF of 303, fig. 3) corresponding to the first multiplexed signal (input of BPF of 303, fig. 3) and the second multiplexed signal (input of BPF of 306, fig. 3) respectively on an input side of the synthetic optical wavelength multiplexer (330, fig. 3) on which the first multiplexed signal and the second multiplexed signal are input.

Regarding claim 7, Novak further teaches a plurality of dispersion compensation fibers (312, 315, fig. 3) corresponding to the first multiplexed signal (output of 303, fig. 3) and the second multiplexed signal (output of 306, fig. 3) respectively on an input side of the synthetic optical wavelength multiplexer (330, fig. 3) on which the first multiplexed signal and the second multiplexed signal are input.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gerstel et al. (US Patent No. 6,721,508) is cited to show a WDM optical communication system with a plurality of multiplexers/demultiplexers having one or more stages and a combination of bands and individual wavelengths.

Li et al. (US Patent No. 6,323,994) is cited to show a WDM system equalization with EDFA optical amplifiers.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran Q. Le whose telephone number is (571)272-2046. The examiner can normally be reached on 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TQL

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